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ABSTRACT

Britain's Further Education Unit (FEU) has continued to work in the areas of management information systems (MIS), particularly, computerized management information systems (CMIS), and their significance for curriculum management. Perceptions about the use of CMIS have been changed. Several reports have noted the limitations of existing systems in relation to wider curriculum change. In addition, notions of efficiency, effectiveness, and quality have evolved, and new demands are being put on further education colleges for information. To be effective, colleges must improve their market research. Data collected in one sector of education must be compatible with that collected in another. Consequent staff development needs relate to ensuring the following: CMIS is understood and used; the system is used to record individual learners' progress; there is frequent updating; there is regular evaluation of the capability of the system; and system hardware and software are maintained. FEU has joined with the National Council for Educational Technology to look at actual and potential links between elements of CMIS, quality, and the curriculum. From this project has emerged the need for an emphasis on CMIS in colleges that could support the move to curricular flexibility. The FEU is undertaking further work to support colleges in development of information systems. (Contains 17 references.) (YLB)

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MANAGEMENT INFORMATION SYSTEMS AND THE CURRICULUM

MARCH 1993

ED357209

INTRODUCTION

This bulletin gives an update on recent work by the Further Education Unit in relation to management information systems (MIS) and, particularly, computerised management information systems (CMIS), and their significance for curriculum management. It also:

- summarises the conclusions of a related project on CMIS, quality and other curriculum issues (RP682);
- describes the work of other current projects and some other organisations in related areas;
- invites colleagues to contribute to and comment on current Unit activity.

It is aimed at senior managers in colleges responsible for curriculum and MIS development, especially those who wish to improve the use of CMIS in managing the curriculum. It will also be useful for other staff as a guide to related issues and readers are asked to bring the bulletin to the attention of relevant colleagues. Staff who are interested in further involvement in this work are invited to complete the reply slip at the end of the bulletin.

BACKGROUND

Given the sizes and nature of colleges and their core activity of providing learning opportunities, the range of information available is not surprising. The recent changes in college governance and finance have had substantial implications for the collection of information. However, there is sometimes a gap between the availability of information and its perceived usefulness to a range of college staff as part of curriculum development. all teaching and learning involves information, but the kinds of information required and used by college management can seem alien to lecturers. The Unit believes that it is more important than ever for explicit use to be made of college management information systems in the information processes which help colleges to support learning.

Colleges require and generate vast amounts of information. Some of this is statistical data (e.g. student numbers, teaching space, income) and may relate to the internal organisational needs of the institution (e.g. room loadings, staff timetables, accounting procedures) or has resulted from external demands and pressures (e.g. for the Further Education Statistical Return, the Annual Monitoring Survey, or the Publication of Information on Student Achievements). Some data relates to the context in which the college operates (e.g. labour market information or numbers of final year local school pupils). Information can be used historically, to record what happened in a former period; it can be used currently, for example to allocate student groups to rooms. At other times it can be used for planning and the design of learning programmes.

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In recent years colleges have been developing CMIS. Such systems were originally intended to support the processing and return of data and statistics for the then DES (now the DFE) and Training Agency (now TEED). Impetus for this development came from the report of the DES/LAA Joint Efficiency Study (JES) in 1987 (*Managing Colleges Efficiently*) and from funding through the system of Education Support Grants and Work-Related FE Development Funds. The JES made clear the link between better access to information and sound management decisions, and emphasised that supplying information required externally should be the consequence of an effective information system, not its very purpose. A summary of and commentary on these developments can be found in the bibliography.

CHANGED PERCEPTIONS ABOUT THE USE OF CMIS

Since the JES much has happened to affect awareness of the role of CMIS.

Limitations

Several reports have noted the limitations of existing systems in relation to wider curriculum change. Thus:

(i) The DES funded a project in 1988 on requirements for CMIS and efficiency which concluded that management information was needed by more staff in colleges than just senior resource managers. It also supported the view that only CMIS could supply the amount and quality of information required.

(ii) A survey by the DES in 1989 predicted difficulties for some college managers in gaining easy access to systems and found that only a minority of colleges were then using their systems to produce information for management purposes.

(iii) A joint DES/Welsh Office/DE CMIS quality assurance project in 1989 reported substantial problems in colleges relating to hardware and software, awareness, and training.

(iv) The 1990 report on the previous projects concluded (para 4.4) that 'all of these issues, however, depend upon one underlying concern — that there should be a radical reappraisal by LEAs and colleges of the nature of FE management: in effect that there should be a cultural change within further education'.

(v) HMI reported in 1990 that 'a few colleges are changing their original procedures and using new techniques of data capture to permit the computer to produce regular reports to aid management, allowing better direction of student learning and more effective course evaluation.

Many college managers now recognise the potential of computerised management information systems and this represents a considerable achievement in the relatively short time. Overall however, progress is, as yet, limited'.

(vi) In 1991 KPMG Management Consulting reported on a study of CMIS for the DES. The report noted a very patchy development and implementation of CMIS strategy caused by a combination of factors, including 'limited understanding of information requirements to produce performance indicators, to model or to support quality assurance processes in a few colleges'. The best practice included, for example, 'key staff in post, both at the senior management level in colleges and in the CMIS team, who understand the potential of CMIS and have the vision to ensure its development and implementation'.

(vii) The summary note accompanying the above concluded that '...the main message, that colleges have some way to go in making full use of their management information systems as a management tool, is one that needs to be heeded whatever the future of the colleges'.

Efficiency and effectiveness

Notions of efficiency, effectiveness and quality have evolved. Information systems may have been able to generate, for example, student-staff ratios and full-time equivalent (FTE) student numbers (although the article referred to above notes that there may have been some 20 ways to calculate FTEs). Moves to methods of unit costing or achievement-led resourcing have been more problematic. Colleges have sought to find ways of using information in their quest to establish 'value added', to improve the quality of teaching and learning, to increase participation, and to improve attainment. The Unit's project RP738 is examining the concept and application of 'value added' or 'distance travelled'. Associated issues have been documented in the Unit's publications and other work on quality.

Incorporation

The Funding Councils are making new demands on colleges for information. Colleges have spent time getting ready for incorporation in terms of finance, personnel and premises. A related publication, in the context of accounting systems, asks 'how well will the proposed system fit with your existing computer systems?' and notes that 'There could well be long-term benefits in using accounting software which can talk to your non-financial MIS'. A series of circulars and bulletins from the English Funding Council has established frameworks and procedures for the exchange of information, for example the return of Further Education Early Student Statistics (FEESS) on enrolments.

COLLEGE INFORMATION NEEDS

Factors for change include new relationships with local authorities and with Training and Enterprise Councils (TECs). Colleges are also adjusting their curriculum offer to defined constituencies and attempting to improve participation as part of their mission. To be effective, colleges must improve their market research: they need hard information about who they are recruiting, how these individuals use education and training, the routes by which they enter, progress and leave, and their achievements. Colleges need to be able to relate the profile of their student body to that of catchment areas (local, regional or national) and groups in order to identify unmet needs and under-representation. They need to be able to establish whether some kinds of learner are more or less successful than others, and in what circumstances. Data collected in one sector of education should be compatible with that collected in another. This is particularly important for adults who have always moved between sectors, and as boundaries dissolve and similar programmes are offered in different places.

The Unit's discussion document *A Basis for Credit?* offers one model for comparing the outcomes of different kinds of learning programmes which would be supported by such an integrated information system.[11] Meanwhile, colleges need to have more sophisticated access to certain data, such as that from census returns, and be able to monitor, for example, the progress of students on more flexible programmes. Work on ethnic monitoring in practice (RP684), on progression from the National Curriculum (RP705), and on reasons for non-participation in FE (RP667), illustrates a range of information needs and concerns over the achievement of integration. One project, with the London Research Centre (RP744), is developing a methodology for colleges to link their data on existing students with the census data for their catchment area. This will enable colleges to identify non-participants, either by geographical area linked to the postcode or by ethnic or socio-economic grouping.

Another project (RP741) examines the planning and strategic resourcing issues facing colleges. The Unit's work on flexibility shows that the college which places the needs of learners at the centre of its activities requires a highly developed CMIS to support marketing, threshold services, flexible access to learning, assessment and accreditation, tutorial processes, and an effective college infrastructure.[12] Work on curriculum and strategic planning (RP694) demonstrated a general level of frustration with CMIS. *The Times Educational Supplement* (11 September 1992) noted that 'sixth-form colleges face bills running into thousands of pounds to upgrade computer systems which cannot cope with the demands as they prepare for independence'.

STAFF DEVELOPMENT ISSUES

The FEU commentary on the section of 1992-3 Grants for Education Support and Training (GEST) which related to CMIS,[13] reflected the context of:

- greater independence for institutions and the increased accountability that will accompany it;
- growing interest in the monitoring of efficiency and effectiveness, and the possibility of new ways of measuring these which will emphasise individual success;
- the need for rapid expansion of the service to meet government targets for increased participation;
- the need to increase differentiated provision through initial diagnosis, personal action plans and flexible delivery to meet government targets for an increase in attainment;
- the extension of the training credits pilot with the subsequent need to monitor the progress of individuals more closely and accurately;

- the growth of the use of records of achievement, with their emphasis on frequent and regular recording of individual achievement;

and consequent staff development needs relating to ensuring:

- CMIS is understood and used;
- the system is used to record the progress of individual learners;
- there is frequent updating, perhaps at course team level, with implications for decentralising control and access to the system;
- there is regular evaluation of the capability of the system;
- maintenance of system hardware and software.

Most commentators on the development of CMIS refer to the need for related staff development. This aspect of management information appears in work referred to below and will be one feature of further research by the Unit.

JOINT WORK WITH NCET

From late 1991 to summer 1992, the Unit was involved in a joint project (RP682) with the National Council for Educational Technology (NCET) to look at actual and potential links between elements of CMIS, quality and the curriculum. The work, undertaken by Helen Williams (Stratford-upon-Avon College) and Elizabeth May (City of Liverpool Community College and, later, Swansea Institute of Higher Education), used contacts with a small sample of colleges to investigate aspects of practice in England, Wales and Scotland. Seven colleges were visited and information from a further six colleges came from members of the project steering group and other contacts.

Although many staff in further education felt that it should be possible to make links between the three elements in order to foster coherent curriculum change, reality was sometimes different. Curriculum, quality and management information systems were often seen as separate, independent entities, developing distinctly. Colleges acknowledged that recent developments in curriculum and quality, together with the increasing need for accountability, required strong links and support from CMIS. From their survey the project workers concluded that the elements 'should inform, enable and support one another and be developed together so that their holistic integrated development benefits the college and its members'.

It appeared that the pockets of excellent practice which link CMIS to, for example, quality systems, recording achievement, student tracking, a modularised curriculum, and training credits, have sometimes been developed independently rather than because of the prevailing CMIS. Their use is often restricted within individual colleges and they are under-resourced. The project identified some known good practice and gaps in current knowledge about progressive procedures. Some of the interesting practice encountered in colleges is highlighted below. Further work is needed to make explicit situations where links could support college developments and, for example, to extend the range of case-study material of good practice.

The issues the project highlighted echoed those from other work, including those in the GEST guidance already mentioned, in relation to, for example:

Staff

- whether staff at all levels have access to CMIS in a clear and understandable form;
- the accuracy of CMIS information and the value put on it by college staff;
- the existence of formal feedback loops to ensure that quality-related decisions based on information and recommendations are communicated back to the originators;
- how far programme teams are able to access and make full use of information held on CMIS;
- the systems for linking staff development records with, for example, staff appraisal, personnel records and Investors in People standards.

Students

- the relationship between resource allocation and individual students and their achievements;
- how far CMIS can monitor the take-up of any student entitlement and provide an accurate picture of student progress;
- systems for processing, recording and analysing enquiries and whether the enquiries analysis informs curriculum planning and development.

Programmes

- the extent in flexible learning systems of the full recording of student attendance and achievement and the link to CMIS;
- how far modular learning programme elements and achievements are recorded on CMIS;
- the nature of the costing policy for the assessment of prior learning (APL) and whether this limits access to qualification routes;
- whether any APL record system links to CMIS;
- whether the process of recording achievement is linked to CMIS.

What emerged was the need for an emphasis on CMIS in colleges which could support the move to being institutions which were flexible in curriculum terms and could cope with the demands of incorporation.

SOME CURRICULUM USES OF CMIS NOTED DURING THE PROJECT

The following examples represent a brief summary of interesting practice encountered in this small sample of colleges. They will be elaborated on in subsequent publications, which will also include an evaluation of developments. The references are not intended to give a full picture of the state of the art and further case study material is not currently available.

Student achievement

College A is using the commercial software Rocket to record APL and complete records of achievement.

College B is using APL for the CGLI 929 'Training the Trainers' series. The college has developed a database to record APL, students' individual action plans and subsequent progress.

College D students record their achievements on a pre-structured computer file. The college has developed a personal achievement record and an accompanying student handbook.

College I has a customised personal development programme linked to the CMIS student record system.

College K is using CMIS to provide pre-printed information for inclusion in records of achievement.

Information, administration, resources

The Principal of College C has led the development of a Scottish User Requirement for CMIS. This covers, for example, finance, personnel, physical resources, curriculum, and student records.

College D publishes a news sheet to keep staff informed of CMIS development strategy. CMIS terminals are located in the registry, student services, reception, the library and the three college annexes.

College E has set up a number of working parties to enable more effective use of CMIS. The register exception/non-attendance reporting system produces absence returns, course and subject lists and attendance charts for use by tutors at parents' evenings.

College F uses electronic point of sale (EPOS) for a rapid, accurate picture of enrolment.

College B uses optical mark-read additional enrolment forms to build up a profile of the enrolled student population.

College G uses computers to enrol students at any location in or outside the college. The data is then aggregated on to the college's main system.

College L has developed a resource planning database linked to CMIS. An expenditure control programme shows course details, training occupation codes, planned enrolments, last year's enrolments and resources deployed. This enables resourcing to follow student enrolments. An ancillary system calculates the books, materials and equipment allocation based on student enrolment.

This college also uses spreadsheets to support the management of sickness costs, TEC credits monitoring, strategic planning and review, and a course costing programme.

College C has devised a package as part of its CMIS which produces an accommodation analysis. This enables adjustments in the timetable throughout the week and the academic year.

Flexible learning

College D is establishing a college NVQ database and has developed systems for registering and monitoring students on flexible/individual study programmes.

Attendance at flexible learning centres is recorded using a variety of methods, for example swipe cards, identity cards and manual registration.

Staff development

Colleges including H, which is developing a staff appraisal system, and F, whose system encompasses teaching and support staff, are linking computerised record-keeping with the Investors in People standards. Many use the Staff Development Management System (SDMS) package to manage staff development records. A number have devised their own computer package or are looking at industrial staff training/personnel record systems.

Modularisation

College C, like all Scottish FE colleges, provides a well-established modular curriculum based on Scottish Vocational Education Council (SCOTVEC) modules. The College's Computer Administration and Management Program (CSCAMP) MIS system is used to record learning outcomes from each module.

College I CMIS is used to map modules and modes of study that are available.

Quality developments

College J's strategic quality management system has 'grown organically' using a database of characteristics, standards and measures with an inbuilt review system.

College J has set up a threshold services quality improvement team, setting its own quality standards, targets and review cycle which are recorded on the database.

College F is using the local authority's computerised course log system. Other colleges have developed similar systems for student, course and review records and some course review mechanisms are being informed by and informing CMIS.

College E is moving towards a CMIS record of 'value added' for individual students involving liaison with examination boards.

College F is working with the Business and Technology Education Council (BTEC) and the A-Level Information System (ALIS) project team on recording 'value added'.

College I will use the BTEC Electronic Data Interchange (EDI) system to record student achievements from CMIS.

College K holds a computer record of scores for examination results on entry and at exit.

Student tracking

College I records student enrolments, destinations and results on the computer systems of partner schools.

College E uses two types of enrolment form: one for personal details and a voucher form for each course, both of which are linked by a student's unique computer-generated number which is retained while he/she is at college.

Threshold services

College M has developed a database, with details of college staff and learning programmes, for use in the reception area.

College C has the Training Access Points (TAPs) database and Systems for Accessing Modular Information (SAMI), an interactive database of SCOTVEC modules and units which builds up a user profile and has proved useful for curriculum planning and development.

THE NEXT STAGE OF FEU WORK

The Unit is undertaking further work to support colleges in the development of information systems which might overcome some difficulties noted above and build on the many examples of good practice.

The related project (RP774) has as its aims:

1. To raise awareness of the ways in which management information systems, particularly computerised systems, can be used in the management of the curriculum, with special reference to the needs of flexible institutions and issues of quality and to the information demands of incorporation.
2. To provide support for institutions in specifying, planning and managing such systems so that they can be used for the more effective management of a flexible curriculum within a quality framework.
3. To make explicit links with other work by the Unit which also has implications for information and planning.

The first stage is to determine the current state of information and CMIS needs from published material and institutional contacts.

It is proposed that FEU will:

- carry out the research above;
- conduct further structured interviews with colleges undertaking work on curriculum quality and tracking learners to compare the findings of the RP682 report and other developments with their experience;
- produce related case studies;
- prepare a map of information needs for specific purposes and a planning handbook for the curriculum specification of systems, which could also include:
  — highlighted issues and case studies;
  — findings from other related work by the Unit;
  — checklists to support an examination of links between (for example) CMIS, quality measures, student tracking, and flexible approaches.

INVITATION FOR CONTRIBUTIONS

Subsequent dissemination of the material and reactions from colleges could lead to further related activity. In the medium term it is hoped that the outcomes of the project might include:

- guidance to colleges on the use of management information systems for the effective management of the curriculum and to meet the demands of external and funding bodies;
- awareness of related good practice;
- support for the system in its relations with software developers and funding bodies;
- more effective use of resources and more sophisticated management of the curriculum.

One important aspect of this will be the responses to this bulletin: colleagues who feel they have something to contribute to the work (for example, a case study description of a CMIS which meets some of the aspirations described above) and/or who would like to be involved in associated activities can contact Kevin Donovan, FEU's Development Officer responsible for the project, by completing the reply slip at the end of this bulletin.

OTHER WORK

Awareness that information could be used more effectively to support the curriculum led to an initiative in early 1992 by NCET, the Staff College, and the National Association for Information Technology in Further Education (NAITFE). The three organisations established a consortium which could provide information and support staff development and, following a questionnaire survey of all UK colleges, published a directory which contains details of which colleges are using which CMIS software and operating systems and for what purposes.[4]

The introduction to the directory notes that its purpose is to:

> '...provide information in an accessible format to help with the management of CMIS in colleges, and to encourage colleges with similar systems to communicate with each other. CMIS managers with day-to-day responsibility for the system and contemplating new purchases may find it useful to browse through the directory to find out which systems other colleges are using and to what extent they are able to download data to other software systems for manipulation.'

The high response rate to the questionnaire, and the acknowledgement of rapid change, has convinced the consortium of the need to keep the directory updated. NCET has a number of related projects and planned publications.

NAITFE, a subscription organisation based largely on corporate membership, produces a variety of published material and has organised national and regional conferences. Those concerned with CMIS have been well-attended and have highlighted the concerns of colleagues and the need for networking. A leaflet published by NAITFE includes the aim 'to provide support to colleges to develop as advanced information-based organisations which will flourish in the 21st century' and adds that 'NAITFE proposes to achieve its aim, in part, through assisting colleges to use information technology in the management of the learning process'.[5]

The National CMIS Board is a 'national user group for everyone concerned with the nuts and bolts of college management information systems' and its members meet to share ways of using CMIS more effectively.[6] The activities of the Board (along with other CMIS developments) were described in a supplement to *Education* magazine (Autumn 1992).[7]

The different organisation of further education in Scotland and Northern Ireland has produced other approaches to CMIS with more unified software, systems and staff development. Related practice has influenced work by the Unit and will be taken into account during the next phase. Details of one related organisation are given at the end of this bulletin.

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17. Details of CMIS developments in Scotland are available in, for example, publications from the Scottish Council for Educational Technology (SCET), Dowanhill, 74 Victoria Crescent Road, Glasgow, G12 9JN.

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